



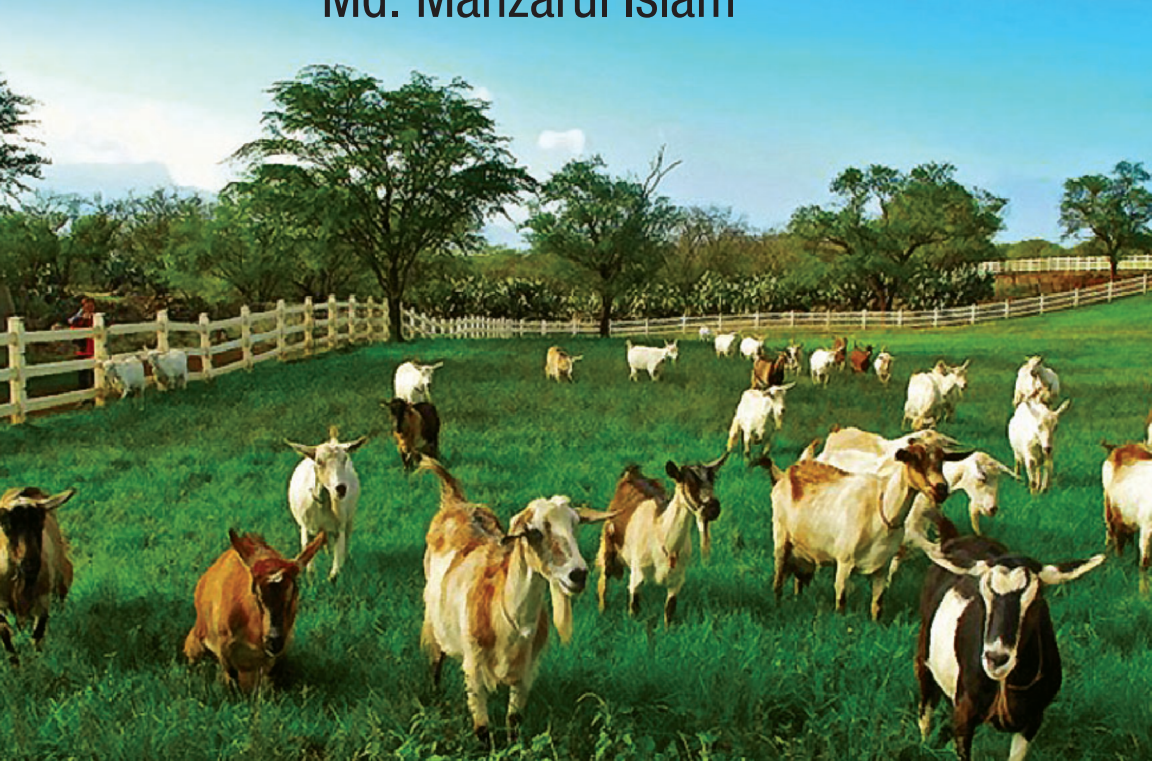
FARM ANIMAL MANAGEMENT

Principles and Practices

EDITORS

Rana Ranjeet Singh

Md. Manzarul Islam



Farm Animal Management

Principles and Practices

Rana Ranjeet Singh

Assistant Professor,
Department of LPM,
Vanbandhu College of Veterinary Sciences & Animal Husbandry
Navsari Agricultural University
Navsari - 396 450, Gujarat

and

Md. Manzarul Islam

Assistant Professor,
Department of LPM,
College of Veterinary Science & Animal Husbandry
Anand Agricultural University
Anand – 388 110, Gujarat



NEW INDIA PUBLISHING AGENCY

New Delhi – 110 034



NEW INDIA PUBLISHING AGENCY

101, Vikas Surya Plaza, CU Block, LSC Market

Pitam Pura, New Delhi 110 034, India

Phone: + 91 (11)27 34 17 17 Fax: + 91(11) 27 34 16 16

Email: info@nipabooks.com

Web: www.nipabooks.com

Feedback at feedbacks@nipabooks.com

© **Editors, 2014**

ISBN : 978-93-83305-03-2

All rights reserved, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior written permission of the publisher or the copyright holder.

This book contains information obtained from authentic and highly regarded sources. Reasonable efforts have been made to publish reliable data and information, but the author/s, editor/s and publisher cannot assume responsibility for the validity of all materials or the consequences of their use. The author/s, editor/s and publisher have attempted to trace and acknowledge the copyright holders of all material reproduced in this publication and apologize to copyright holders if permission and acknowledgements to publish in this form have not been taken. If any copyright material has not been acknowledged please write and let us know so we may rectify it, in subsequent reprints.

Trademark notice: Presentations, logos (the way they are written/presented) in this book are under the trademarks of the publisher and hence, if copied/resembled the copier will be prosecuted under the law.

Composed, Designed and Printed in India

Contents

<i>Dedication</i>	<i>v</i>
<i>Preface</i>	<i>vii</i>
<i>List of Contributors</i>	<i>ix</i>
1. An Introduction to Animal Husbandry	1
Taxonomic Classification of Common Livestock Species	1
Domestication of Farm Animals	5
History of Livestock Rearing in India	6
Livestock Production System	8
Agro-Climatic Zones	10
Comparative Highest and Lowest Priority Agro-climatic Zones According to the Density of the Different Livestock Species (Sastry, 1994)	12
Distribution of Land and Livestock Holdings Across Different Operational Holding in India	15
Role of Livestock in Indian Economy.....	16
Production Statistics	25
Livestock and Livestock Products Market and Marketing ..	34
2. General Principles of Livestock Management	37
Body Parts of Farm Animals	37
Approach, Handling and Restraining of Livestock	37
Handling and Restraint	40

Methods of Animal Identification	59
Determination of Age of Animals by Various Methods	65
Methods of Controlling External Parasites of Livestock	78
Determination of Body Weight using Different Body Measurements	80
Transport of Livestock by Rail, Road, Air and on Foot	82
General Conditions for Transport of Livestock	82
Identification of Sick Animals	87
Methods of Drug Administration	90
Animal Behaviour Terminology & Common Vices of Animals, their Prevention and Control	94
3. Breeds of Livestock	103
Animal Genetic Resources	103
Risk Status Classification	105
DAD-IS Monitors Breeds Worldwide and Classifies them into the following Risk Categories	105
Species, Breed and Strain	106
Cattle Breeds of India	107
Buffalo Breeds of India	114
Important Sheep (<i>Ovis aries</i>) Breeds of India	117
Goat (<i>Capra hircus</i>) Breeds of India	124
Pig Breeds of India	128
Horse Breeds of India	129
Camel Breeds of India	130
Indian Poultry (<i>Gallus domesticus</i>) Breeds	131
Breed Descriptors	138
4. Fodder Production and Grassland Management...	143
History	144
Common Livestock Feed Resources	144
Supply and Demand of Livestock Feed and Fodder	145
Importance of Cultivated Fodders and Grassland in Livestock Production	146

Farm Machinery and Equipment	147
Soil and Water Conservation	149
Irrigation and Drainage for Fodder Production	150
Agronomical Practices for Production of Leguminous and Non-leguminous Fodders in Different Seasons	151
A. Non Legume/Cereal Fodder Crops	151
B. Leguminous Fodder Crops	156
C. Grasses	162
D. Fodder Trees	166
Harvesting and Post-harvest Techniques for Fodder Preservation	169
Silage	171
Hay	174
Storage of Feeds and Fodders	176
Scarcity Fodders	177
Newly Formed Feeds during Scarcity Period	180
Feed and Fodder Management for Individual Animals	180
Calculation of Feed Requirement of Individual Animals	181
Feeding Management of Individual Cattle or Buffalo	181
Fodder Production for Small Units through Inter- Cropping or Back Yard Cultivation	182
Livestock Waste Utilisation and Recycling	183
Calculation of Economic Aspects of Fodder Cropping and Procurement of Feed	185
Grassland Management	185
Grazing Management	190
5. Livestock Housing and Sanitation	195
Functions of Livestock Housing	195
General Principles of Design and Construction of Housing ...	198
Points to be Considered for Selection of Site	199
Type of Animal Housing	201
A. Housing for Cattle & Buffaloes	201

B. Housing for Sheep & Goats	205
C. Housing for Pigs	206
Arrangement of Farm Buildings	209
Construction Details of Various Structures	209
Modifications in Loose Housing System for Cattle and Buffaloes	219
Disinfection & Commonly Used Disinfectants	224
6. Dairy Bovine Production	229
Origin & Distribution of Cattle	229
Origin & Distribution of Buffalo	230
Important Traits of Cattle & Buffalo	232
Care and Management of Different Categories of Cattle & Buffaloes	234
Care and Management of Heifers	245
Reproduction Management of Dairy Animals	246
Care and Management of Pregnant Cows and Down-Calvers	251
Care and Management of Milking Cows & Buffaloes	253
Methods of Milking	257
Factors Influencing Quantity and Quality of Milk	260
Dry Cow Management	265
Clean Milk Production	265
Factors Altering Quality of Milk	266
Advantages of Clean Milk Production	267
Measures to Produce Quality Milk	267
Care and Management of Bull	270
Care and Management of Bullocks	272
Healthcare Practices of Dairy Animals	276
General Care and Management of Sick Animals	279
Labour Management	284
Farm Record and Record Keeping	285
Advantage/ Utility of Keeping Farm Records	286

Selection and Culling of Dairy Animals	287
Preparation of Animal for Show	288
Judging of Dairy Animals	291
Economics of Dairy Farming	298
7. Goat Production	299
Origin and Domestication of Goat	299
Phylogenetic Classification of Goat	300
Characteristics of Goat	300
Goat Population and Distribution	301
Advantages of Goat Farming	301
Disadvantages of Goat Farming	302
Scope of Goat Farming in India	303
Goat Production Systems	303
Breeds of Goats	304
Housing of Goats	305
Feeds and Feeding of Goats	305
Nutrient Requirement of Goats	307
Grazing and Feeding Systems	309
Care and Management of Different Categories of Goats	310
Care and Management of Fattening Stock	313
Care and Management of Breeding Goat	314
Mating Systems	318
Marketing and Transport of Goats	325
Goat Products	325
Preparation of Animals for Show	331
8. Sheep Production	337
Origin and Domestication of Sheep	337
Classification	337
Characteristics of Sheep	338
Scope of Sheep Farming in India	339
Advantages of Sheep Farming	340
Disadvantages of Sheep Farming	340

Comparison of Sheep and Goat	341
Sheep Production Systems	342
Breeds of Sheep	343
Housing of Sheep	343
Feeding and Watering of Sheep	343
Feeding of Different Categories of Sheep	344
Care and Management of Different Categories of Sheep	347
Care and Management of Breeding Sheep	351
Essential Farm Operations on Sheep Farm	352
Mating Systems	353
Health Care of Sheep	355
Marketing and Transport of Sheep	359
Sheep Products	359
Shearing of Sheep	364
Preparation of Animals for Show	370
Judging Sheep	370
Some Common Terms Related to Sheep Production	371
9. Swine Production	373
Origin and Domestication of Pigs	373
Phylogenetic Classification of the Pig	373
Characteristics of Pigs	374
Pig Population and Distribution	375
Advantages of Swine Farming	375
Disadvantages of Swine Farming	376
Scope of Swine Farming in India	377
Pig Production Systems	377
Breeds of Pigs	378
Housing of Pigs	379
Feeds and Feeding of Pigs	379
Nutrient Requirement of Pigs	381
Care and Management of Different Categories of Pigs	382
Care and Management of Piglets up to Weaning	383

Care and Management of Lactating Sow/Gilt	386
Care and Management of Growing-Finishing Pigs	386
Care and Management of Breeding Pigs	388
Care and Management of Pregnant Sow/Gilt	391
Care and Management of Sow/Gilt at Farrowing	392
Pig Health and Diseases	393
Marketing and Transport of Pigs	398
Pork Production	399
Preparation of Pig for Show	401
10. Laboratory Animals	405
Laboratory Mice	406
Laboratory Rats	407
Guinea Pigs	409
Laboratory Rabbits	410
Transportation of Laboratory Animals	412
Record Keeping and Handling of Laboratory Animals	413
Housing of Laboratory Animals	413
Nutrition of Laboratory Animals	417
Breeding and Reproductive Management in Laboratory Animals	420
Care of Young Ones	425
Disposal of Animal Carcasses	427
Specific Pathogen Free (SPF) Animal Production	427
Gnotobiotic Animal Production	427
Disease of Laboratory Animals	428
CPCSEA Guidelines for Good Laboratory Practices (GLP) ..	429
The Concept of the 3R ^s	430
Accreditation of Laboratory Animals	430
Commercial Rabbit Farming	431
Advantages of Rabbit Farming	431
11. Equines.....	433
Equine Population in India	433
Use of Equines in General	433

Breeds of Horses	434
Breeds of Donkey	435
General Management Practices	436
Health Care for Equines	440
Important Terminologies Related with Equine Husbandry ...	444
12. Camel Production	447
Origin and Distribution of Camel	447
Population	448
Breeds	448
Peculiarities of Camel	448
Feeding and Watering	450
Housing	450
Reproduction	451
Utility of Camels	452
Health Care	453
Commonly Occurring Diseases in Camel are	453
Important Points Regarding General Management of Camel	454
13. Avian Production	455
Important Economic Traits of Poultry	455
New Coloured Feathered Birds Developed	458
Reproduction in Fowl	459
Formation of Eggs	460
Structure of Egg	460
Scavenging System of Management for Raising of Chicks, Scavenger Feed Base of Village	461
Low Input Technology: Backyard and Semi Intensive Unit of Various Sizes	462
Mixed Farming and Poultry Raising	463
Concept of Self Local Market	464
Poultry Farming in Hilly Areas	465
Limitations in Hill Farming	465

Organic Poultry Farming	465
Brooding and Rearing Practices used for Chicken, Duck, Quail, Turkey and Guinea Fowl	466
Preparation before Chick's Arrival	467
Poultry Housing	476
Location of Poultry Houses	476
Important Points Regarding Construction of Poultry Houses	477
Different Types of Poultry Houses	477
Systems of Poultry Housing	478
Poultry House Equipments	482
Summer Management of Poultry	484
Management Points to be Followed for Preventing Birds from Heat Stress are	484
Winter Management of Poultry	485
Feeding and Watering of Birds	486
Classification of Poultry Feeds	487
Feed Ingredients in Poultry Ration	488
Nutrients Requirement for Different Age Groups	488
Feed Formulation	489
Feed Restriction	489
Water Requirement in Poultry	489
Poultry Health Care Management	490
Vaccination Schedule for Poultry	493
Precautions During Vaccination	494
Poultry Bio-Security	495
Poultry Judging	495
Judging of Broilers for Meat Production	495
Vices in Poultry and its Remedial Measures	497
Poultry Farm Records	498
Marketing of Poultry and Poultry Products	498
Important Terminologies	499
14. Climatology and Animal Production	503
Classification of World Climate	505
Climatic Regions of India	506

Physical Environment and its Interaction with Animal	510
Heat Load in Animals	511
Calculation of Heat Load	512
Morphological, Anatomical, Behavioural and Physiological Adaptation in Harsh Climate	518
Salient Morphological, Anatomical and Functional Adaptation in Domestic Animals	520
Hyperthermia and Fever	524
Animal Defences Against Harsh Climate	525
General Effects/Signs of Heat Stress	526
Effect of Climate on Animal Production	526
Effect of Climate on Animal Growth	527
Effect of Climate on Milk, Meat and Egg Production	527
Effect of Climate on Wool Production	528
Effect of Climate on Animal Reproduction	529
Effect of Photoperiodism on Animals	529
General Measures to Reduce Heat Stress/Summer Management	530
15. Organic Livestock Farming	535
History of Organic Livestock Farming	536
Status of Organic Animal Rearing in India and World	536
Risk Factors	546
Conclusion	547
Bibliography	549

FARM ANIMAL MANAGEMENT

Principles and Practices

READERSHIP: Meant for students of B. V. Sc. & A. H., animal science, dairy science but will also act as an adjunct to the wisdom of teachers, farm managers, extension and dairy workers, farmers etc in the subject of livestock production and management.

Livestock rearing is an integral part of socio-economic framework of India since time immemorial. Livestock sub-sector being a vital component of agriculture sector, plays a multidimensional role and acts as a tool in achieving nutritional security, employment generation and socio-economic development of rural sector, particularly among the landless, small, marginal farmers and women.

India possesses huge livestock population of varying production potentials, distributed across different agro-ecological zones under different operational and livestock holding size. Hence, it requires different package of practices for their management. Further, factors like drivers of development change and climate change pose many challenges to this sector. Farm animal management encompasses integrated and precise application of basic scientific principles of breeding, feeding, heeding and weeding in general as well as in times of specific need. Therefore, an attempt has been made in this book to cover all these basic and applied aspects of livestock management in detail. In the perspective of reorganization of the syllabus of veterinary science and animal husbandry programme. This book is appropriately divided into fifteen chapters covering almost each and every aspect of livestock production management.

Rana Ranjeet Singh: Assistant Professor, Department of LPM, Vanbandhu College of Veterinary Science and Animal Husbandry, Navsari Agricultural University, Navsari 396 450, Gujarat

Md. Manzarul Islam: Assistant Professor, Department of LPM, College of Veterinary Science and Animal Husbandry, Anand Agricultural University, Anand, Gujarat



NEW INDIA PUBLISHING AGENCY

101, Vikas Surya Plaza, CU Block, L.S.C. Market
Pitam Pura, New Delhi-110 034, India

Tel. : +91(11) 27341717, Fax : +91(11) 27341616

E-mail : info@nipabooks.com

Web : www.nipabooks.com

ISBN 9789383305032

